RCEME

PRE-ARTIFICER
ASSESSMENT STANDARDS

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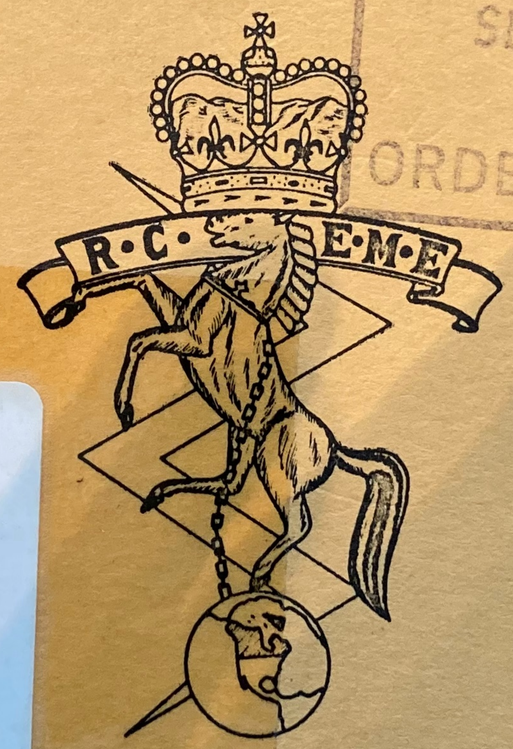

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PREFACE

HOW TO USE THIS BOOKLET

1. INTRODUCTION

This booklet was prepared at the RCEME School. It contains the approved assessment standards for artificers in all trades.

2. HOW TO USE IT

Once you complete your Senior NCO Course you should start preparing yourself for artificer training. Do not leave all your studying until the last week before the course starts; instead use this booklet as a study guide. Decide how much time you are prepared to spend studying on a regular basis and set up a study programme. As you complete the various parts of the applicable assessment standards, you should check them off the list. When the time comes for your assessment, a good review will refresh your memory.

3. AMENDMENTS

These standards may be amended periodically, depending on several factors. Amendments will be published on a wide distribution. When a new booklet is prepared it will have a different colored cover and will show the effective date on the front cover.

4. CONCLUSION

Statistics show that artificer candidates who have prepared themselves for the assessment seldom fail. Start studying now.

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PRE-ARTIFICER ASSESSMENT

1. GENERAL

a. During the 1959/60 training year artificer candidates will continue to take the complete assessment at The RCEME School.

b. A new type of pre-artificer assessment will start on 1 Apr 60, under authority HQ 3310-1 (MT2A) dated 29 Jun 59. Under the new system candidates will no longer come to The RCEME School for the complete assessment.

2. NEW SYSTEM

The new system will be as follows:

a. Assessment papers on academic and trade theory subjects, prepared by The RCEME School, will be written over a two day period at command writing centers in April of each year and forwarded to The RCEME School for marking. Results will be passed to DEME who in turn will inform commands. Candidates will be informed of the results by their Command EME.

b. Successful candidates will be sent on artificer courses. During the first week of the course, candidates will be given additional examinations in practical trade subjects. At the conclusion of these examinations an Artificer Assessment Board will sit and consider the results of all examinations. The Board will decide which candidates are to continue the course. Those who fail will be returned to their units.

3. SELECTION OF CANDIDATES

a. Selection of candidates to write examinations at command writing centers will be made by AHQ. Candidates must be recommended by their Commanding Officer before they will be permitted to write the assessment papers.

b. Candidates attached to non-RCEME units must be recommended by the Camp, Area or Command EME of the area in which the candidate is employed.

RCEME PRE-ARTIFICER ASSESSMENT STANDARDS

TABLE OF CONTENTS

SERIAL	ANNEX	TITLE
1		Standards for Vehicle, Instrument, Armament and Small Arms Artificers
	1	List of Equipment
	2	Functions and References
2		Standards for Electrical, Radio, Radar and Fire Control System Artificers
	1	List of Equipment
	2	Functions and References

SERIAL 1
HQ 3675-A15/1 (ME)
24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

VEHICLE, INSTRUMENT, ARMAMENT AND SMALL ARMS ARTIFICERS

AIM

1. To ensure that the candidate has sufficient academic and trade knowledge to be able to absorb the instruction given on the course.

TRADE ASSESSMENT

2. The trade assessment will be based on the current trade specification for the candidate's basic trade or trades ~~as published in the Canadian Army Manual of Trades and Specialties. Where the trade specification has not been rewritten and published in the Canadian Army Manual of Trades and Specialties the current training standard for the applicable trade will be used.~~

3. Candidates for the Armament Artificer course will be assessed as Gun Mechanic Group 3 and Machinist Fitter Group 2. Candidates for the Vehicle Artificer course will be assessed as Vehicle Mechanic Wheeled Group 3 and Vehicle Mechanic Tracked Group 3.

4. Attached as Annex 1 is a list of equipment the candidate can expect to be assessed on when he arrives at the School for the practical portion of the assessment.

ACADEMIC ASSESSMENT

5. The academic assessment will be based on the subjects detailed in Annex 2.

ANNEX 1
TO SERIAL 1
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

VEHICLE, INSTRUMENT, ARMAMENT AND SMALL ARMS ARTIFICERS

LIST OF EQUIPMENT

1. ARMAMENT

   a. 105-mm Howitzer,
   b. 155-mm Howitzer,
   c. 90-mm Gun,
   d. 20-pr Gun,
   e. Lathe (up to Machinist Fitter Group 2).

2. INSTRUMENTS

   a. Clinometer field (all Mks),
   b. Quadrant gunners M1,
   c. Clinometer inspectors Mk 3,
   d. Quadrant elevation M9,
   e. Director No 7 (all Mks),
   f. Mount telescope M21A1, M23, M48, M25 and M90,
   g. Compass prismatic liquid Mk 3 and CDN No 1 Mk 1 and 1/1,
   h. Telescope elbow M16A1 pattern,
   i. Telescope sighting (all types),
   j. Binocular prismatic Nos 2 and 5 (all Mks),
   k. Binocular periscopic AFV (all Mks),
   l. Rangefinder (all coincident types),
   m. Lathe,
   n. Grinder,
   o. Drill press.

(NOTE: Where all Mks are listed, questions will be common to all Mks.)

3. SMALL ARMS

   a. Rifle C no 7 .22-in Mk 1,
   b. Rifle FN 7.62-mm (C1),
   c. Rifle automatic FN 7.62-mm C2,
   d. Pistol signal 1-in No 1 Mk 2/1 and Mk 6,
   e. Pistol Browning FN 9-mm HP,

..../2

f. 60-mm mortar,
g. 81-mm mortar,
h. 3.5-in rocket launcher,
i. 3.2-in rocket launcher,
j. Gun machine Browning cal 30 Model 1919A4,
k. Gun sub-machine 9-mm (C1).

4. VEHICLES

a. Truck utility 1/4-ton 4 x 4 M38 CDN,
b. Truck utility 1/4-ton 4 x 4 M38A1 CDN,
c. Truck cargo 3/4-ton 4 x 4 M37 CDN,
d. Truck cargo 2½-ton 6 x 6 M135 CDN,
e. Truck recovery medium 5-ton M62,
f. Bendix-Westinghouse power brakes,
g. Tank medium Centurion Mk 5,
h. Tank medium M4A2E8 Sherman,
i. Motorcycle light (Triumph),
j. Truck stake 3-ton SC IHC,
k. Engine GM diesel,
l. Engine IHC diesel,
m. Engine Caterpillar diesel.

ANNEX 2
TO SERIAL 1
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

VEHICLE, INSTRUMENT, ARMAMENT AND SMALL ARMS ARTIFICERS

Reference Material

GM 1 - General Mathematics Book 1 by Jackson, Dean and Crawford. Publisher - MacMillan Co of Canada Ltd.

GM 2 - General Mathematics Book 2 by Lougheed and Workman. Publisher - MacMillan Co of Canada Ltd.

IS 1 - Intermediate Science Book 1 by Bruce and Carter. Publisher - Sir Issac Pitman & Sons (Canada) Limited.

SERIAL	SUBJECT	STANDARD	REFERENCES
a	b	c	d
1	Arithmetic	Must be able to carry out accurately arithmetical calculations involving:	
		a. whole numbers,	GM 1: pages 1-26
		b. common fractions,	GM 1: pages 27-48
		c. decimal fractions,	GM 1: pages 49-64
		d. percentages,	GM 1: pages 64-68
		e. powers and roots,	GM 1: pages 10-14
		f. square roots,	GM 1: pages 345-348
		g. metric system,	GM 1: pages 81-99
		h. graphs.	GM 1: pages 186-209

.../2

ANNEX 2
TO SERIAL 1
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

VEHICLE, INSTRUMENT, ARMAMENT AND SMALL ARMS ARTIFICERS

SERIAL	SUBJECT	STANDARD	REFERENCES
a	b	c	d
2	Algebra	Must know:	
		a. algebraic notation,	GM 1: pages 100-122
		b. methods of solving simple equations	GM 1: pages 123-140
		c. the concept of positive and negative numbers.	GM 1: pages 211-220
		Must be able to carry out accurately algebraic calculations including:	
		a. addition and subtraction,	GM 1: pages 221-238
		b. multiplication,	GM 1: pages 239-252
		c. division,	GM 1: pages 253-260
		d. simple factoring,	GM 1: pages 261-284
		e. applications of factoring,	GM 1: pages 285-299
		f. problems involving simple equations,	GM 1: pages 300-328

.../3

ANNEX 2
TO SERIAL 1
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

VEHICLE, INSTRUMENT, ARMAMENT AND SMALL ARMS ARTIFICERS

SERIAL	SUBJECT	STANDARD	REFERENCES
a	b	c	d
		g. equations with two unknowns,	GM 2: pages 136-153
		h. co-ordinates and graphs.	GM 2: pages 155-181
3	Geometry	Must know constructions and mensuration of geometrical figures including:	
		a. the circle,	GM 1: pages 142-145 and 349-352
		b. angles,	GM 1: pages 151-176
		c. triangles, parallelograms and trapeziums,	GM 1: pages 177-183
		d. regular polygons,	GM 1: pages 184-185
		Must know:	
		a. similar triangles and their applications,	GM 1: pages 329-338
		b. pythagorean theorem.	GM 1: pages 338-348

.../4

ANNEX 2
TO SERIAL 1
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

VEHICLE, INSTRUMENT, ARMAMENT AND SMALL ARMS ARTIFICERS

SERIAL	SUBJECT	STANDARD	REFERENCES
a	b	c	d
4	Trigonometry	Must know elementary trigonometry including:	
		a. ratios of acute angles,	GM 2: pages 221-229
		b. trigonometrical tables,	GM 2: pages 229-234
		c. ratios of 45°, 60°, 30°,	GM 2: pages 234-235
		d. solution of right angled triangles,	GM 2: pages 236-244
		e. problems involving right angled triangles.	GM 2: pages 261-267
5	Science	Must know:	
		a. measurement, force and pressure,	IS 1: pages 28-51
		b. work, energy and power,	IS 1: pages 52-66
		c. states of matter and changes of state,	IS 1: pages 70-79

.../5

ANNEX 2
TO SERIAL 1
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

VEHICLE, INSTRUMENT, ARMAMENT AND SMALL ARMS ARTIFICERS

SERIAL	SUBJECT	STANDARD	REFERENCES
a	b	c	d
		d. properties of water	IS 1: pages 87-96
		e. properties of air,	IS 1: pages 99-139
		f. quantity and measurement of heat,	IS 1: pages 140-160
		g. heat transfer,	IS 1: pages 160-170
		h. magnetic and electrical energy.	IS 1: pages 182-217

SERIAL 2
TO HQ 3675-A15/1 (ME)
24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

ELECTRICAL, RADIO, RADAR AND FIRE CONTROL SYSTEM ARTIFICERS

AIM

1. To ensure that the candidate has sufficient academic and trade knowledge to be able to absorb the instruction given on the course.

TRADE ASSESSMENT

2. The trade assessment will be based on the current trade specification for the candidate's basic trade ~~as published in the Canadian Army Manual of Trades and Specialties. Where the trade specification has not been rewritten and published in the Canadian Army Manual of Trades and Specialties the current training standard for the applicable trade will be used.~~

3. Attached as Annex 1 is a list of equipment the candidate can expect to be assessed on when he arrives at the School for the practical portion of the assessment.

ACADEMIC ASSESSMENT

4. The academic assessment will be based on the subjects detailed in Annex 2.

ANNEX 1
TO SERIAL 2
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

ELECTRICAL, RADIO, RADAR AND FIRE CONTROL SYSTEM ARTIFICERS

LIST OF EQUIPMENT

1. ELECTRICAL

   a. Electronic battery charger,
   b. Charging set 300 watt CHI 395,
   c. Generating set PE95K, 10 Kw,
   d. Generating set PU 5006, 30 Kw,
   e. Electrical components of 1/4, 3/4, 2 1/2 and 5 ton SMP trucks,
   f. Ignition, wiring systems and FVGCE of Centurion tanks,
   g. Small motors and miscellaneous appliances.

2. RADIO

   a. Transmitter CDN No 43 MK 2,
   b. Radio set CPRC 26,
   c. Radio set AN/PRC 510,
   d. Reception set CR 91 A,
   e. Wireless set CDN No 19 Mk 3.

3. FIRE CONTROL SYSTEMS

   a. AA FCS M33C (including IFF)
   b. Remote control system M201 (90mm).

4. RADAR

   a. Radar equipment AN/MPS 504 (including IFF).

ANNEX 2
TO SERIAL 2
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

ELECTRICAL, RADIO, RADAR AND FIRE CONTROL SYSTEM ARTIFICERS

Reference Material

GM 1 - General Mathematics Book 1 by Jackson, Dean and Crawford. Publisher - MacMillan Co of Canada Ltd.

MER - Mathematics for Electricians and Radiomen by Cooke. Publisher - McGraw-Hill Co of Canada Ltd.

VC - Visualized Chemistry by Lemkin. Publisher - Oxford University Press.

VP - Vitalized Physics 4th Edition by RH Carleton. Publisher - The John Winston Co Ltd.

SERIAL	SUBJECT	STANDARD	REFERENCES
a	b	c	d
1	Arithmetic	Must be able to carry out accurately arithmetical calculations involving:	
		a. whole numbers,	GM 1: pages 1-26
		b. common fractions,	GM 1: pages 27-48
		c. decimal fractions and percentages,	GM 1: pages 49-68
		d. metric system.	GM 1: pages 81-99
		Must be able to use powers of ten and a slide rule for arithmetical operations.	MER: chap 7

.../2

ANNEX 2
TO SERIAL 2
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

ELECTRICAL, RADIO, RADAR AND FIRE CONTROL SYSTEM ARTIFICERS

SERIAL	SUBJECT	STANDARD	REFERENCES
a	b	c	d
2	Algebra	Must know algebraic notation and be able to carry out accurately algebraic calculations involving:	
		a. addition and subtraction,	MER: pages 5-24
		b. multiplication,	MER: pages 25-35
		c. division,	MER: pages 36-42
		d. simple equations,	MER: pages 43-54
		e. special products and factoring,	MER: pages 103-124
		f. fractions,	MER: pages 125-146
		g. fractional equations,	MER: pages 147-161
		h. simultaneous linear equations,	MER: pages 181-207
		i. exponents and radicals,	MER: pages 222-238
		j. quadratic equations,	MER: pages 239-257

.../3

ANNEX 2
TO SERIAL 2
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

ELECTRICAL, RADIO, RADAR AND FIRE CONTROL SYSTEM ARTIFICERS

SERIAL	SUBJECT	STANDARD	REFERENCES
a	b	c	d
		k. logarithms,	MER: pages 279-308
		l. decibels,	MER: pages 309-326
		m. elementary plane vectors,	MER: pages 396-406
		n. vector algebra.	MER: pages 483-498
3	Geometry	Must know construction and mensuration of geometrical figures including:	
		a. the circle	GM 1: pages 142-145 and 349-352
		b. angles,	GM 1: pages 151-176
		c. triangles, parallelograms and trapeziums,	GM 1: pages 177-183
		d. regular polygons.	GM 1: pages 184-185
		Must know:	
		a. similar triangles and their applications,	GM 1: pages 329-338

.../4

ANNEX 2
TO SERIAL 2
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

ELECTRICAL, RADIO, RADAR AND FIRE CONTROL SYSTEM ARTIFICERS

SERIAL	SUBJECT	STANDARD	REFERENCES
a	b	c	d
		b. pythagorian theorem.	GM 1: pages 338-348
4	Trigonometry	Must know the basic principles of trigonometry including:	
		a. measurement of angles,	MER: pages 327-338
		b. ratios of acute angles,	MER: pages 339-345
		c. functions of any angle,	MER: pages 345-349
		d. functions of 45°, 60°, 30°, 0°, 90°,	MER: pages 349-353
		e. tables of functions,	MER: pages 356-362
		f. functions of angles greater than 90°,	MER: pages 362-370
		g. solution of right triangles,	MER: pages 371-378
		h. problems involving right triangles,	MER: pages 378-380

.../5

ANNEX 2
TO SERIAL 2
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

ELECTRICAL, RADIO, RADAR AND FIRE CONTROL SYSTEM ARTIFICERS

SERIAL	SUBJECT	STANDARD	REFERENCES
a	b	c	d
		j. periodic functions.	MER: pages 381-395
5	Chemistry	Must know:	
		a. the chemical view of matter,	VC: pages 1-6
		b. properties of oxygen,	VC: pages 9-17
		c. properties of water,	VC: pages 29-42
		d. the atomic theory,	VC: pages 45-53
		e. the electron theory,	VC: pages 55-63
		f. the ionization theory,	VC: pages 65-73
		g. chemical calculations,	VC: pages 273-295
		h. nuclear fission and atomic energy.	VC: pages 296-320
6	Physics	Must know:	
		a. mass, weight and density,	VP: pages 3-8
		b. buoyancy in fluids,	VP: pages 27-37

.../6

ANNEX 2
TO SERIAL 2
TO HQ 3675-A15/1 (ME)
DATED 24 APR 59

TRAINING STANDARD

ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

PRE-ARTIFICER ASSESSMENT

FOR

ELECTRICAL, RADIO, RADAR AND FIRE CONTROL SYSTEM ARTIFICER

SERIAL	SUBJECT	STANDARD	REFERENCES
a	b	c	d
		c. simple and compound machines,	VP: pages 38-64
		d. work, energy and power,	VP: pages 77-94
		e. motion of bodies,	VP: pages 96-115
		f. heat and its transfer	VP: pages 117-125
		g. expansion and thermometry,	VP: pages 127-137
		h. quantity and measurement of heat,	VP: pages 140-142
		j. heat and work.	VP: pages 160-168